Name _____ **AP Chem** ___/___/___

Chapter 8 – Extra Credit - #3

Solve the following multiple choice problems for up to **5 TEST extra credit points**. Answers are due by **3:45 pm** today. It might be a good time to talk to a classmate you haven't so far and compare notes. My room is available. **#IWANT100% #YOTAPCO**

35/35 = 5 EC points; 34/35 = 4 EC points; 33/35 = 3 EC points; 32/35 = 2 EC points; 31/35 = 1 EC point

89 days until the AP Chemistry exam!!! Circle and write the correct answer on the line in front of the question. Good Luck!!!

1. A Which of the following molecules has the shortest bond length?
   a. N_2 b. O_2 c. Cl_2 d. Br_2 e. I_2

2. B For which of the following molecules are resonance structures necessary to describe the bonding satisfactorily?
   a. H_2Se b. SeO_2 c. CS_2 d. SeF_2 e. NF_3

3. C Which of the following bonds is expected to be most polar?
   a. C-Si b. C-N c. O-C d. S-C e. H-C

4. D For which of the following may we draw both polar and nonpolar Lewis structures?
   a. $CHCl_3$ b. PH_3 c. BF_3 d. SF_2Cl_4 e. PCl_5

5. B Which of the following has a non-bonding pair of electrons on the central atom?
   a. BCl_3 b. NH_3 c. CCl_2Br_2 d. PF_5 e. SO_4^{2-}

Use the following answers for questions 6-10. Choose the correct geometry for the molecules listed.
a. trigonal planar b. trigonal pyramidal c. linear
d. bent e. tetrahedral

6. D OF_2
7. B PH_3
8. D NO_2^-
9. E CH_2F_2
10. A BF_3

11. C The SF_5^- ion has a square pyramidal structure. The hybridization of the orbitals in sulfur is:
   a. dsp^3 b. sp c. d^2sp^3 d. sp^3 e. sp^2

12. D Which of the following is not a linear structure?
   a. I_2 b. I_3^- c. CO_2 d. H_2S e. H-C≡C-H

13. A The Lewis structure of the cyanide ion most closely resembles:
   a. N_2 b. O_2 c. CO_2 d. NO e. C_2H_2

14. C In which of the following pairs are the two items NOT properly related?
   a. sp^3 and 109.5° b. trigonal planar and 120° c. octahedral and dsp^3
   d. sp and 180° e. square planar and d^2sp^3

15. C How many resonance structures are possible for the CO_2 molecule?
   a. none b. 2 c. 3 d. 4 e. 4/3

16. E Pi bonding occurs in each of the following species EXCEPT
   a. CO_2 b. NO_3^- c. CN^- d. SO_2 e. SiH_4

17. D Ca, V, Co, Zn, As

Gaseous atoms of which of the elements above are paramagnetic?
a. Ca and As only b. Zn and As only c. Ca, V, and Co only
d. V, Co, and As only e. V, Co, and Zn only

Use the following answers for questions 18 - 22. Choose the correct geometry for the molecules listed.

a. trigonal planar b. trigonal pyramidal c. square pyramidal
d. bent e. tetrahedral

18. D OBr_2

19. B PCl_3

20. A NO_3^-

21. C BrF_5

22. B NF_3

Use the following answers for questions 23 - 25.

a. O b. La c. Rb d. Mg e. N

23. A What is the most electronegative element of the above?

24. E Which element exhibits the greatest number of different oxidation states?

25. D Which of the elements above has the smallest ionic radius for its most commonly found ion?

26. E The elements in which of the following have most nearly the same atomic radius?

a. Be, B, C, N b. Ne, Ar, Kr, Xe c. Mg, Ca, Sr, Ba
d. C, P, Se, I e. Cr, Mn, Fe, Co

27. C Which of the following sets of quantum numbers (n, l, ml, ms) best describes the valence electron of highest energy in a ground-state gallium atom (atomic number 31)?

a. 4, 0, 0, ½ b. 4, 0, 1, ½ c. 4, 1, 1, ½ d. 4, 1, 2, ½ e. 4, 2, 0, ½

28. B Pi bonding occurs in each of the following species EXCEPT

a. HCN b. CCl_2F_2 c. SiO_2 d. SeO_2 e. SiO_3^{2-}

29. B The bonding in carbon monosulfide consists of:

a. 2 sigma bonds and 1 pi bond b. 1 sigma bond and 2 pi bonds
c. 3 pi bonds d. 3 sigma bonds e. 1 sigma and 1 pi bond

30. E Which species has the smallest Cl-A-Cl bond angle where A is the central atom?

a. BCl_3 b. CCl_4 c. NCl_3 d. OCl_2 e. SCl_6

31. D If a sulfur trioxide molecule is drawn so that the formal charge on each atom is zero, it will have the following types of bonds:

a. 3 σ and 0 π b. 3 σ and 1 π c. 3 σ and 2 π d. 3 σ and 3 π e. 3 σ and 6 π

32. D Which of the following atoms is the most paramagnetic?

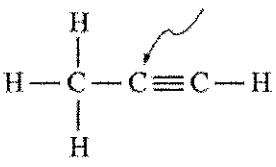
a. sodium b. aluminum c. magnesium d. sulfur e. chlorine

33. B I. PF_4^+ II. SF_2 III. NO

Which species have one or more atoms that violate the octet rule?

a. I and II only b. III only c. I only d. I, II &III e. I and III only

Use the structural formula for propyne, (CH_3CCH) to the right for questions 34-35.



34. A What is the hybridization of the carbon atom indicated by the arrow?

a. sp b. sp^2 c. sp^3 d. dsp^3 e. d^2sp^3

35. C Indicate the total number of sigma (σ) bonds and the total number of pi (π) bonds in the molecule.

a. 8 sigma & 0 pi b. 7 sigma and 1 pi c. 6 sigma & 2 pi
d. 5 sigma & 3 pi e. 3 sigma & 5 pi